Appendix

G

PROJECT ADVISORY COMMITTEE MEETING MINUTES

The following pages present the minutes of meetings held by the Project Advisory Committee during the course of the Study. Three meetings of the Committee were held. Members of the Committee received draft copies of the working papers and reports prepared for review and comment prior to each meeting.

NAVIGATIONAL AIDS AND AVIATION SERVICES SPECIAL STUDY

PLANNING ADVISORY COMMITTEE MEETING #1 MINUTES

MEMBERS PRESENT

Stacy Howard, AOPA
Wayland K. Adams, Honeywell
Denis Kelleher, Honeywell
Roger Sims, Sawyer Aviation
Sean Jeralds, Embry-Riddle
Skip Paschke, Phoenix TRACON
Gary Adams, ADOT Aeronautics
Glen Wilson, ADOT Aeronautics
Ray Boucher, ADOT Aeronautics
Mike Covalt, AZAA
Jerry Gleich, Allied Signal
Arv Schultz, Arizona Flyways
Ron Price, QED

MEMBERS ABSENT

Michael Lewis, Mesa Airlines
Joe Gibson, AIREvac
Jim Timm, AAA
Roger Carlin, HAI

The first Planning Advisory Committee (PAC) was held at 1:30 PM, August 5, 1997, in the Executive Conference Room at the Arizona Department of Transportation (ADOT), in Phoenix, Arizona. Following is a brief resume of the meeting and the subjects discussed:

A. Welcome by Gary Adams, Director, Aeronautics Division: Mr. Adams discussed the uniqueness in this study in comparison with other studies of this nature in that the State will be seeking some guidance on what the "customers" (pilots, fixed base operators, airport managers, etc.) desire from the State. A major portion of the study will be spent on determining what these needs are, determining the best way of providing them, building a plan to deliver these needs and then organizing the resources to deliver the equipment or services to the "customers".

B. Ron Price, Principal, QED, Aviation & Airport Consultants, provided a short sketch of his background and experience in developing studies of this kind and alluded to the uniqueness in making the users of navigational aids and services a part of the study. He then discussed the major objectives of the study, the existing working papers and what the PAC can expect at the next meeting.

C. Existing System Facilities:

1. The initial working papers provided an inventory of the States navigational aids and determined that all but 2 terminal aids (NDB, VOR, ILS, etc.) are maintained by the federal agencies. Notable exceptions are Nogales and Scottsdale NDB's and Avra Valley, Lake Havasu City, Colorado City, Chandler, Ryan Field, Sedona

and Taylor AWOS-3's. On the contrary, most all of the landing and lighting aids at airports in the State are maintained by the airports. Notable exceptions are the approach lighting systems at the airports with ILS approaches that are maintained by the FAA or military and some VASI and REIL systems.

2. The working papers described the salient characteristics of each navigational aid and communication system used in the State as well as the weather equipment. There were a few AWOS and NDB facilities awaiting frequencies in order to be placed within the system. The National Weather Radar system provided nearly 90 percent coverage of the State with noticeable weak coverage in the southeastern areas and the "Four Corners" area.

B. Forecasts of Aviation Activity: Refer to the working papers.

C. Technological Assessment:

1. The full spectrum of GPS and the FAA's approach to the new technology were discussed. Important points to consider are FAA's intention to divest itself of maintaining all navigational aids by 2010. The schedule listed in the working papers is considered preliminary as many political as well as technical issues have to be resolved. But the GPS systems, WAAS and LAAS, are planned for deployment as soon as the vendors can provide the equipment. In the meantime, the SCAT-1 system is being employed at a few airports to accommodate needs of some of the users who cannot wait for a precision approach where conventional ILS does not provide a suitable signal. FAA is not very supportive of the SCAT-1 system but will consider it on a case -by-case basis. SCAT-1 may be viewed as an interim solution until LAAS is operational.

2. AWOS-3 facilities output can be transmitted to the federal weather circuits when certain protocols are met. ASOS units located at towered airports do not broadcast observations when the tower is in operation. As the State initiates an upgrade to its telecommunications system, there may be opportunities to link non-federal AWOS units as well as similar systems such as roadway weather information systems, to serve the wide variety of weather users in Arizona. This data can also be routed to the federal weather circuit.

3. We see the distinction between non-precision and precision instrument approaches diminishing within the GPS technology. The capability to provide precision instrument approach capability at an airport will not be the limiting factor. Terrain, obstructions, inability to meet minimum separation standards, etc. will be the determinants in whether or not a precision approach can be obtained at an airport. Equipment, both ground and aircraft, will not be the limiting factors. These factors will be assessed in the next working paper and weighted to determine priorities and resources required.

D. Discussion: There might be a problem with traffic congestion at Prescott created by the high level of student pilot training and the regular traffic to Ernest A. Love Field. It appears many solutions are available but not all interested parties are agreed on any action plan. A radar facility has been proposed that could satisfy traffic at three airports (Flagstaff-Pulliam, Grand Canyon National Park and Ernest A. Love Field).

E. Working Paper Two: Next meeting the following subjects will be covered:

1. Visual Aid Requirements
2. TERPS Requirements
3. Communications Requirements
4. Survey Results

Enclosed is a comment sheet for you to indicate any corrections/comments you wish to make on the first Working Paper. We encourage you to make any comments you wish and we will do our best to accommodate them or indicate to you why we did not. An updated PAC list (we apologize for the misspelled names in the previous submittal) is also enclosed.

Ron Price, QED

RB/rp

Enclosures

NAVIGATIONAL AIDS AND AVIATION SERVICES SPECIAL STUDY

PLANNING ADVISORY COMMITTEE MEETING #2 MINUTES

MEMBERS PRESENT

Richard Dawson, AIREvac
Wayland K. Adams, Honeywell
Burnie Rundall, Allied Signal
Roger Sims, Sawyer Aviation
Sean Jeralds, Embry-Riddle
Jim Timm, APA
Gary Adams, ADOT Aeronautic
Ray Boucher, ADOT Aeronautics
Darrell Purcell, AZAA
David Pankoutz, Allied Signal
Ron Price, QED
Harry Wolfe, MAG Transportation

MEMBERS ABSENT

Arv Schultz, Arizona Flyways
Stacy Howard, AOPA
Skip Paschke, Phoenix TRACON
Roger Carlin, HAI
Michael Lewis, Mesa Airlines
Denis Kelleher, Honeywell

GUESTS

Jim Mc Cue, Glendale Airport Manager
Mark Meyers, Mesa-Falcon Field
Arnold Pokorski, Phoenix-Sky Harbor

The second Planning Advisory Committee (PAC) was held at 1:00 PM, February 6, 1998, in the Board Room at the Arizona Department of Transportation (ADOT), in Phoenix, Arizona. Following is a brief resume of the meeting and the subjects discussed:

A. The meeting was opened by Gary Adams, Director, Aeronautics Division. He emphasized that one of the outcomes of the meeting was to achieve a consensus on the criteria used to evaluate the GPS approaches for airports in Arizona.

B. Ron Price, Principal, QED, Aviation & Airport Consultants, provided a short synopsis of the first meeting and the initial draft working papers. He then discussed the major objectives of the study, the existing working papers and what the PAC can expect at the next meeting.

C. Comments from PAC:

1. Wayland Adams, Honeywell, provided an update on the WAAS/LAAS and DGPS programs from the FAA perspective. DGPS, as currently approved by the FAA, can achieve minimums down to and including 250 feet and 1/2 mile. FAA has indicated that they will approve lower decision heights for DGPS systems down to 200 ft for future installations. The Honeywell system CAT 1 DGPS can be purchased at a cost of 390K. Installation, on average, will cost about 100K and the total system about 500K. LAAS is planned for implementation in 1999 with CAT 3 approaches to begin in 2003.

2. The PAC indicated that there was a shortage of instrument approach practice facilities in the northern part of Arizona and we should consider this aspect in the NAVAIDS study.

3. In prioritizing IFR approach facilities, access to particular airports for medical emergency should be placed in the list of priorities. Helicopter operations into facilities at night and in IFR weather are extremely limited by a lack of IFR approaches lighting, services, etc.

4. Heliports were not reviewed in the study nor are there any IFR facilities setup for helicopters, especially in the northern region. This needs to be looked into in the next study.

5. Approval of the airport analysis for GPS approaches: The committee agreed to use the FAA TERPS and Airport Design guidelines to determine the ability of airports to meet GPS criteria.

6. The committee agreed to the criteria that all commercial service airports and Relievers should be programmed for GPS precision instrument approaches (CAT 1, 200 ft and 1/2 mile visibility).

7. The committee approved the criteria that all other paved runway, public use airports in the State should be reviewed for non-precision instrument approaches (300 ft and 3/4 mile; 400 ft and 1 mile). The committee also approved adding all active Native American Airports. The following airports will be included in the inventory of airports to be analyzed: Chinle, Grand Canyon West, Lukachukai, Pine Springs, Polacca, Rock Point, Rocky Ridge, San Carols and Shonto.

8. Air Services: The major items coming out of the Air Services questionnaires were:

(1) Pilots desired an Arizona Aeronautical Chart with airport diagrams and appropriate information.

(2) Pilots requested electronic connection to ADOT Aeronautics Airport database through a web-site or a disc containing airport 5010 and other useful information.

(3) Pilots requested more information seminars on subjects such as how the Aviation Revenues are distributed/used, aviation safety and aviation information in general.

9. The following text changes to the Working Papers were recommended and will be addressed in the final documents:

a. Glendale Airport: Revise Tables 5-3, 5-5 and 5-6.
b. Stellar Airport: Obstruction to Rwy 35 not indicated.
c. Review Williams-Gateway Peak Hour IFR operations.
d. Provide an explanation/definition of the Groupings in the text prior to introducing the Groupings in a table.
e. Expand the section on Differential GPS (Page 5-65) based on the briefing by Mr. Adams.
f. Figure 5-1: Indicate any existing military airport GPS coverage and include a footnote that the GPS is available only with prior permission or in an emergency.
g. Figure 5-2: Note the area without coverage with a shade/color and note that GPS coverage is/is not provided by airport(s) in other states. Include military airport GPS coverage .
h. For more clarity, change titles of Tables 5-7 and 5-4 to "Non-alphabetical Sort". Place footnotes on each page of a table, not just the last page.
i. Table 5-7: Add a footnote indicating that new airports are assumed to meet the requirements of an IAP.

The meeting closed with a discussion of the subjects for the next PAC.

Ron Price, QED

RB/rp

NAVIGATIONAL AIDS AND AVIATION SERVICES SPECIAL STUDY

PLANNING ADVISORY COMMITTEE MEETING #3 MINUTES

MEMBERS PRESENT
Arv Schultz, Arizona Flyways
Stacy Howard, AOPA
Skip Paschke, Phoenix TRACON
Glen Wilson, ADOT
David Bostrom, Embry-Riddle
Tom Rabourn, APA
Gary Adams, ADOT Aeronautic
Ray Boucher, ADOT Aeronautics
Darrell Purcell, AZAA
Ron Price, QED
Harry Wolfe, MAG Transportation

MEMBERS ABSENT
Richard Dawson, AIREvac
Wayland K. Adams, Honeywell
Burnie Rundall, Allied Signal
Roger Carlin, HAI
Michael Lewis, Mesa Airlines
Denis Kelleher, Honeywell

GUESTS
Greg Chenowith, Chandler Arpt Manager
Charlie Mangum, Mesa-Falcon Field
Arnold Pokorski, Phoenix-Sky Harbor

The third Planning Advisory Committee (PAC) was held at 1:00 PM, July 28, 1998, in the Board Room at the Arizona Department of Transportation (ADOT), in Phoenix, Arizona. Following is a brief resume of the meeting and the subjects discussed:

A. The meeting was opened by Gary Adams, Director, Aeronautics Division.

B. Ron Price, Principal, QED, Aviation & Airport Consultants, provided a short synopsis of the previous meetings and the draft final working papers. He then discussed the activities that have been conducted subsequent to the last PAC meeting:

1. Pilot Information Meetings: Although well publicized, they were not well attended, however, the comments received were constructive. Among the suggestions were:

a. Incorporate reflective material in the paint used to mark movements surfaces on an airport.

b. Improve the number of Recreational Airports in the State.

c. Publish the "State Map" and include airport directory information.

d. Place an RTR facility on the top of Navajo Mountain as communications in this area are marginal.

e. Provide a practice GPS approach facility in the phoenix metropolitan area.

f. Promote and inform airports/sponsors about low interest loan program.

g. Pilots complimented ADOT Aeronautics for allowing them an opportunity to provide input in the study.

C. Ron Price then went over the highlights of each new Chapter submitted in the final draft. In sequential order, the following comments were recorded:

1. Comments from the PAC on Chapter Six:

a. The PAC agreed to the minimum standard guidelines with one exception. Add lighted segmented circle to the minimum standards.

b. Yuma International is listed as a GA airport in Table 6-2, page 6-8.

2. Comments from the PAC on Chapter Seven:

a. Clarify the text to indicate the 25 mile radius of the "circles" used in the exhibits in this chapter represent radio transmission range, not weather data range. Weather data is only appropriate for on the airport.

b. How many AWOS-3's can be contacted by phone? Indicate in the text or table which ones ***do not*** have a telephonic connection.

c. Flight Service Stations (FSS) obtain their weather information from NWS, and not from monitoring the State's ASOS/AWOS facilities. This limits the weather data available to the FSS as only a few ASOS's communicate with NWS.

3. Comments from the PAC on Chapter Eight:

a. Include a requirement for an RCO facility in northern Arizona between Prescott & Flagstaff, preferably on or near V-12 airway.

b. How much does a GCO cost ? Answer: $10,000.

c. Review the operational data on Memorial Airfield. It is difficult to understand how an airport that is closed and generating very little activity can obtain a cost-benefit ration of "1". (NOTE: Don't eliminate the airport from consideration for a GCO if other factors besides cost warrant the installation.)

d. Were cellular phones considered as economical alternative to a GCO? Answer: No. Further study of this issue may be required.

4. Comments from the PAC on Chapter Nine: Discussion on the aviation services assessment was that some of the suggestions offered by users of airports may not be within the ability of ADOT Aeronautics to control (wash racks, hangars, etc.).

Aeronautics may be able to promote their use/installation but the airport itself is primarily responsible for obtaining these facilities.

5. Comments from the PAC on Chapter Ten: Discussion centered on what factors/steps should be accomplished to obtain a State weather network. Not enough detail was given in the text as to what agencies/resources existed within the State (existing facilities, points of contact, type of equipment, etc.) to allow Aeronautics to determine the feasibility of establishing a Statewide weather network. This chapter dealt with a "generic" concept and needs to be specific to what is available in Arizona.

6. Comments from the PAC on Chapter Eleven: In the Tables developed for the information disseminated in this chapter, a factor was used to diminish the impact of the forecast data used to determine the staging of facilities and costs. Forecast data may not be very accurate, especially when it exceeds five years from the base year. To diminish the effect of long range forecasts over a 20 year period, the staging for facilities was reduced to a ten-year planning period. In other words, if an airport was not *forecast* to need a facility until the end of the 20-year planning period, that facility would be programmed to be installed in a maximum of 10 years from the time of the study.

7. GENERAL COMMENTS:

a. The Transponder Landing System (instead of a precision instrument GPS) was programmed to be installed at four airports in Arizona. These were not indicated in the text and need to be included in Chapter 11.

b. The FAA's current F&E program for Arizona needs to be included in the document as an appendix or addendum to the Tables in Chapter 11.

c. In the prioritization of navaid equipment during the 10-year planning period, communication associated equipment needs to be given highest priority among the navaids.

d. In the executive summary and/or text of the document we need to discuss the "finding" that the Northeast are of the State is the weakest in navaid facilities and what steps should be taken to improve navaid coverage in the area.

The meeting closed with a request to the PAC members to submit their comments no later than August 10 in order to allow the QED adequate time to correct/ammend the final document. Gary Adams thanked all the PAC members for their support and input during the study and stated that it was an essential and important factor to the successful conclusion of the Navaids and Aviation Services Study.

Ray Boucher, Aviation Program Analyst

Enclosures

August 10, 1998

Mr. Ray Boucher
Arizona Department of Transportation
Aeronautics Division
1833 W Buchanan St
Phoenix AZ 85007-3335

Dear Ray

Thank you for including AOPA as a member of your advisory team for ADOT's Navigational Aids and Aviation Services Special Study.

The Navaids Study reveals a host of facilities and services which could be provided all or in part by ADOT Aeronautics Division. Recent changes in the amount of funding to the department, however, will make state participation in these improvements difficult if not impossible It is essential that funding levels for the State Aviation Program be restored to pre 1998 levels to assure that planned airport projects and recommended improvements to navigational aids and aviation services are implemented, and that the time, money and talent expended on this study is not wasted.

Instrument Approach Procedure Analyses
I agree with study conclusions for establishment of GPS-IAP improvements at **Libby, Page** and **Showlow** airports. System area coverage for the State of Arizona justifies proposed improvements at these airports. The state should also consider that **Tuba City** is an important airport for medical transport and provides critical relief services to the reservation during heavy winter storms. The cost/benefit ratio of improvements at Tuba City could easily be out weighed by system need. In light of recent FAA efforts to reduce IAP capability at **Yuma**, and because Yuma is the only airport in southeast Arizona which currently has an ILS, I believe the study should weigh in more heavily on the continuing need for precision an IAP at this airport.

AWOS
State Aeronautics could play an important part in the national AWOS program to assure that AWOS installations meet the system needs of the state as opposed to providing minimal reductions to DH at metropolitan reliever airports. We endorse new AWOS installations as depicted in Figure 7-5 to provide maximum coverage and utility, and believe they should be coupled with state sponsored education programs to inform pilots about the usefulness of this improved AWOS system as a tool for interpreting current weather and weather trends along their route of flight.

Remote Communication Outlet Requirements
As with GPS-IAP and AWOS, we believe ground based remote communications outlets could significantly improve Arizona's airport system, however, the candidate list as provided by the study shoul be revised based upon more current data

Aviation Services Assessment

Telephone - The study indicates that telephone service is a capability which appears to be well accommodated. The exception to this is Tuba City. This airport is frequently used for Life Flight operations and it's location several miles out of town warrants the installation of telephone service. The state could play a role in funding such service directly, or encouraging tribal funding of telephone service.

Education Seminars/Publications - We support the involvement of ADOT Aeronautics in pilot education and information programs. This is an area sorely neglected by State Aeronautics in recent years. Partnering activity as suggested by the study could be accomplished through the FAA Aviation Safety Program, AOPA Air Safety Foundation and others. Through partnering, educational programs meeting the specific needs of Arizona pilots could be provided at considerable savings when compared to programs funded solely by the state. Criteria and curriculum outlines can be developed by the state and supplied to prospective service providers.

Weather Data Network

The concept of a weather data network is appealing, and we would support state investigation into such a program, but only after above recommendations for improving GPS and AWOS systems have been met. Current policies within the NWS make establishment of the system as described in the study a far in the future possibility

Implementation Program

The implementation program for both GPS procedures and AWOS installations should be influenced more than the four factors suggested in the study, i.e. dependence upon WAAS, ability of airports to meet design standards, economic justification, and further standards surveys. A fifth factor should be added to the list which considers contributions selected approach and AWOS improvements can make to overall aviation safety. Surrounding terrain, distance from suitably equipped alternate landing sites, and the airport's propensity for inclement or rapidly changing weather should also influence and airport's priority rating in the staging program. By applying this additional criteria, airports such as **Laughlin/Bullhead, Libby AAF/Sierra Vista, Page Municipal, Showlow Municipal, Tuba City and San Manuel**, could easily move into an earlier stage of system development.

Sincerely,

Stacy Howard
Western Regional Representative
Aircraft Owners and Pilots Administration